

***REMARKS***1. **Present Status of the Application**

In response to the Office Action dated June 9, 2004, Applicants respectfully request reconsideration based on above claim amendments and the following remarks. Upon entry of the amendments in this response, claims 1, 3, 5-10 and 17-20 remain pending in the present application. Applicants respectfully submit that the claims as presented are in condition for allowance.

2. **Objection of Claim 5**

Claim 5 has been objected to as containing certain informalities. In response to the objection, claim 5 has been amended to overcome the stated objection. Therefore, Applicants respectfully request that the objection of this claim be withdrawn.

3. **Rejection of Claims 1, 3, and 5-10 Under 35 U.S.C. §103(a)**

Claims 1, 3, and 5-10 were rejected under §103(a) as being allegedly anticipated by *Chen* (U.S. Patent No. 6,256,383) in view of *Haakansson* (U.S. Patent No. 5,933,797). For a proper rejection of a claim under 35 U.S.C. Section 103, the teachings of the prior art reference must suggest all features of the claimed invention to one of ordinary skill in the art. *See, e.g., In re Dow Chemical*, 837 F.2d 469, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988); *In re Keller*, 642 F.2d 413, 208 U.S.P.Q. 871, 881 (C.C.P.A. 1981).

a. **Claim 1**

As provided in independent claim 1, Applicants claim:

1. A transceiver, comprising:  
means for receiving a locally generated transmit signal;  
means for coupling the locally generated transmit signal to a communication medium, the means for coupling further coupled to a remotely generated receive signal; and  
a multi-stage digital filter comprising *a dual-stage finite impulse response (FIR) filter, the multi-stage digital filter configured to reduce both short-term echo components and long-tail echo components of the locally generated transmit signal, one stage of the dual-stage FIR filter separately processing the short-term echo components and another stage of the dual stage FIR filter*

*separately processing the long-tail components, wherein the reduction of transmit signal echo is realized in a hybrid echo canceller.*

(Emphasis added).

Applicants respectfully submits that independent claim 1 is allowable for at least the reason that *Chen* in view of *Haakansson* does not disclose, teach, or suggest anywhere in the specification or in the figures at least the feature of “a dual stage finite impulse (FIR) filter . . . configured to reduce both short-term echo components and long-tail echo components . . . one stage of the dual FIR filter separately processing the short-term echo components and another stage of the dual stage FIR filter separately processing the long-tail components” as recited in claim 1. Rather, *Chen* discloses an “automatic balance system 10 which includes an FIR filter system 32 and non-adaptive IIR filter system 40.” Col. 5, lines 39-42 (Emphasis added). Therefore, *Chen* fails to disclose, teach, or suggest a “dual stage finite impulse (FIR) filter.”

The Office Action states that *Haakansson* “teaches such features for a purpose of canceling the echo signals in communication system.” (Citations Omitted). However, *Haakansson* discloses a system for implementing a dual filter structure utilizing a fixed filter for echo cancellation and an adaptive filter for echo path estimation. Thus, *Haakansson* appears to utilize a first filter for processing all the components of an echo signal and second filter to update the coefficients of the first filter. Thus, *Haakansson* fails to disclose, teach, or suggest at least the feature of “one stage of the dual-stage FIR filter separately processing the short-term echo components and another stage of the dual stage FIR filter separately processing the long-tail components.” Thus, the proposed combination of *Chen* in view of *Haakansson* fails to disclose, teach, or suggest all of the features of claim 1.

Further, to make a *prima facie* case for obviousness, there must be some prior art teaching or established knowledge that would suggest to a person having ordinary skill in the pertinent art to fill the voids apparent in the applied reference. “Moreover, the question is not simply whether the prior art 'teaches' the particular element of the invention, but whether it would 'suggest the desirability, and thus the obviousness, of making the combination.'” *ALCO Standard Corp. v. Tennessee Valley Authority*, 808 F.2d 1490, 1498, 1 U.S.P.Q.2d 1337, 1343 (Fed. Cir. 1986).

As such, *Chen* teaches away from *Haakansson*, and thus, the proposed combination of *Chen* with *Haakansson* to reject the disputed claims is improper. *See, e.g., Application of Mercier*, 515 F.2d 1161, 185 U.S.P.Q. 774, 778 (C.C.P.A. 1975) ("The relevant portions of a reference include not only those teachings which would suggest particular aspects of an invention to one having ordinary skill in the art, but also those teachings which would lead such a person away from the claimed invention.")

For example, *Chen* states that a "problem with many conventional automatic balance systems is that they employ a large number of finite impulse response (FIR) filter taps (e.g., 32 taps) in order to properly replicate the echo signal." Col. 2, lines 38-42. In contrast from *Chen*, the system in *Haakansson* utilizes a dual stage FIR filter. Hence, the proposed combination of *Chen* in view of *Haakansson* is improper, since the proposed combination is not suggested by the individual references.

For at least these reasons, the rejection of claim 1 should be withdrawn.

b. Claim 3

Because independent claim 1 is allowable over the prior art of record, dependent claim 3 (which depends from independent claim 1) is allowable as a matter of law for at least the reason that dependent claim 3 contains all the elements and features of independent claim 1. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

c. Claims 5-10

Because independent claim 1 is allowable over the prior art of record, dependent claims 5-10 (which depend from independent claim 1) are allowable as a matter of law for at least the reason that dependent claims 5-10 contain all the elements and features of independent claim 1.

Additionally and notwithstanding the foregoing reasons for allowability of claims 5-10, dependent claims 5-10 recite further features and/or combinations of features (as is apparent by examination of the claim itself) that are patentably distinct from the prior art of record. For example, with regard to claim 8 (from which claims 9-10 depend), the feature "wherein the second stage uses an interpolation scheme to determine coefficients to apply at each of the taps disposed between taps associated with a derived coefficient," as recited in claim 8, is not

disclosed or suggested by *Chen* in view of *Haakansson*. (Emphasis added).

Accordingly, the rejection of claims 5-10 should be withdrawn.

4. Rejection of Claims 17 and 19-20 Under 35 U.S.C. §103(a)

Claims 17 and 19-20 were rejected under §103(a) as being allegedly anticipated by *Chen* (U.S. Patent No. 6,256,383) in view of *Betts* (U.S. Patent No. 5,659,581). For a proper rejection of a claim under 35 U.S.C. Section 103, the teachings of the prior art reference must suggest all features of the claimed invention to one of ordinary skill in the art. *See, e.g., In re Dow Chemical*, 837 F.2d 469, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988); *In re Keller*, 642 F.2d 413, 208 U.S.P.Q. 871, 881 (C.C.P.A. 1981).

a. Claim 17

As provided in independent claim 17, Applicants claim:

17. A digital signal transceiver, comprising:  
a transmitter configured to receive a locally generated transmit signal;  
a hybrid electrically coupled to the transmitter configured to receive and  
inductively couple the transmit signal to a two-wire transmission line, the  
hybrid further configured to receive a remotely generated receive signal along  
the two-wire transmission line;  
a receiver configured to process the remotely generated receive signal; and  
an echo canceller disposed in parallel between the transmitter and the  
receiver configured to reduce both short-term echo components and long-tail echo  
components of the locally generated transmit signal **wherein the echo canceller  
calculates coefficient values for less than N taps while emulating a N tap digital  
filter.**

(Emphasis added).

Applicants respectfully submits that independent claim 17 is allowable for at least the reason that *Chen* in view of *Betts* does not disclose, teach, or suggest anywhere in the specification or in the figures at least the feature “wherein the echo canceller calculates coefficient values for less than N taps while emulating a N tap digital filter,” as recited in claim 17.

The Office Action states that “Chen fails to clearly teach the echo canceller calculates coefficient values for less than N taps while emulating an N tap digital filter.” Further, the Office Action alleges that *Betts* teaches such features “for the purpose of calculating the coefficient of the filters.” In reviewing the passage cited by the Office Action, however, Applicants are unable to ascertain where *Betts* discloses the feature “wherein the echo canceller calculates coefficient values for less than N taps while emulating a N tap digital filter.” For instance, although *Betts* states that an “EC 145 adapts by performing updates, i.e., of its coefficients,” this statement does not disclose, teach, or suggest the feature of an echo canceller calculating coefficient values for less than N taps while emulating a N tap digital filter. *See* col. 4, lines 14-15. As such, the proposed combination of *Chen* in view of *Betts* does not render the claim invention unpatentable.

Therefore, the rejection of claim 17 should be withdrawn.

b. Claims 19-20

Because independent claim 17 is allowable over the prior art of record, dependent claims 19-20 (which depend from independent claim 17) are allowable as a matter of law for at least the reason that dependent claims 19-20 contain all the elements and features of independent claim 17.

5. Rejection of Claim 18 Under 35 U.S.C. §103(a)

Claim 18 was rejected under §103(a) as being allegedly anticipated by *Chen* in view of *Betts* in further view of *Haakansson*. For a proper rejection of a claim under 35 U.S.C. Section 103, the teachings of the prior art reference must suggest all features of the claimed invention to one of ordinary skill in the art. *See, e.g., In re Dow Chemical*, 837 F.2d 469, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988); *In re Keller*, 642 F.2d 413, 208 U.S.P.Q. 871, 881 (C.C.P.A. 1981).

Because independent claim 17 is allowable over the prior art of record, dependent claim 18 (which depends from independent claim 17) is allowable as a matter of law for at least the reason that dependent claim 18 contains all the elements and features of independent claim 17. Further, to make a *prima facie* case for obviousness, there must be some prior art teaching or established knowledge that would suggest to a person having ordinary skill in the pertinent art to fill the voids apparent in the applied reference. "Moreover, the question is not simply whether the

prior art 'teaches' the particular element of the invention, but whether it would 'suggest the desirability, and thus the obviousness, of making the combination.'" *ALCO Standard Corp. v. Tennessee Valley Authority*, 808 F.2d 1490, 1498, 1 U.S.P.Q.2d 1337, 1343 (Fed. Cir. 1986).

As such, *Chen* teaches away from *Haakansson*, and thus, the proposed combination of *Chen* with *Haakansson* and *Betts* to reject the disputed claims is improper. *See, e.g., Application of Mercier*, 515 F.2d 1161, 185 U.S.P.Q. 774, 778 (C.C.P.A. 1975) ("The relevant portions of a reference include not only those teachings which would suggest particular aspects of an invention to one having ordinary skill in the art, but also those teachings which would lead such a person away from the claimed invention.")

For example, *Chen* states that a "problem with many conventional automatic balance systems is that they employ a large number of finite impulse response (FIR) filter taps (e.g., 32 taps) in order to properly replicate the echo signal." Col. 2, lines 38-42. Accordingly, *Chen* teaches a system featuring a non-adaptive infinite impulse response (IIR) filter in lieu of a FIR filter. In contrast from *Chen*, *Haakansson* teaches the use of a dual stage FIR filter. Hence, the proposed combination of *Chen* in view of *Betts* in further view of *Haakansson* is improper, since the proposed combination is not suggested by the individual references.

For at least these reasons, the rejection of claim 18 should be withdrawn.

6. Cited Art Made of Record

The cited art made of record has been considered, but is not believed to affect the patentability of the presently pending claims.

**CONCLUSION**

In light of the foregoing amendments and for at least the reasons set forth above, Applicants respectfully submit that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the now pending claims 1, 3, 5-10, and 17-20 are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned agent at (770) 933-9500.

A credit card authorization has been provided to cover the charge for the accompanying petition for a one-month extension of time. No additional fee is believed to be due in connection with this amendment and response to Office Action. If, however, any additional fee is believed to be due or if there is any deficiency in the fee submitted, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,



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